User's Guide

QSound

QSOUND™

CREATIVE

CREATIVE LABS

QSound User's Guide

Second Edition: January 1994

Table of Contents

Bringing QSound to Your PCs

We are currently working with other software developers to bring the QSound audio imaging technology to the personal computer and multimedia industry. Our objective is to provide an audio experience of unparalleled clarity and realism.

With QSound, developers can design and implement new applications and games requiring a higher level of skill and adventure. By extending the sound field far off to each side, well beyond the speakers, developers can certainly add a new dimension to their games and applications.

Imagine getting extra points for destroying an enemy because you were able to hear it coming before you could see it. Imagine hearing the sound of a helicopter as an aural target well beyond the bounds of the speakers. And as the helicopter becomes a visual target on the CRT, imagine all the other realistic sounds that could be generated according to the program and user directives.

You may also imagine that you are surrounded by the hums, buzzes, and bleeps of your space cruiser, with the crew acknowledging your commands from their stations to your left and right. We may have a stereo file with left channel recorded with the hums, buzzes, and bleeps and the right channel recorded with human talking sources to achieve the above mentioned effect. We may pan the left channel hums at the center position. We may also pan the human voice to the extreme left or right position to make the human voice sounds as if they are coming from the left or right.

The potential of QSound applications is simply amazing. In essence, QSound can submerge you in a near real-world experience—bordering on *audio virtual realism.*

The rest of this guide will show you how to set up your system to experience the power of QSound.

Introducing QSound

QSound is a revolutionary sound placement technology that generates realistic and accurate sound spatial distribution. It requires only a traditional stereo playback system for reproduction. Even then, sound seems to emanate from a specific location outside of the speaker bounds creating a complete environmental soundscape.

The conventional stereo sound field is limited within the speaker geometry (see Figure 1). But with QSound, you can generate a soundscape that exceeds the physical bounds of a conventional stereo speaker geometry (see Figure 2).

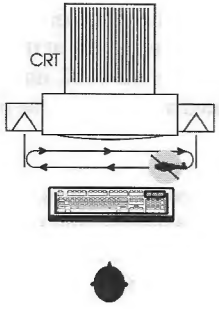

Figure 1: Dynamics of Stereo

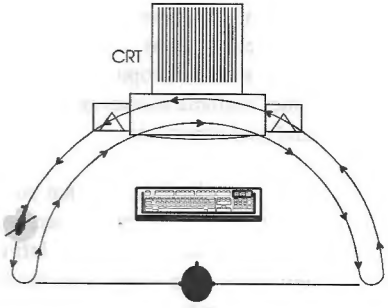

Figure 2: Dynamics of QSound

QSound can be implemented in two ways. The first way is when a recording studio adds the QSound effects during the final mix (when multiple tracks are combined in two stereo tracks). The sound mix with the QSound processed elements can then be played back with any two-channel stereo system. The other way is through real-time processing using a digital signal processor (DSP).

The introduction of QSound in our Advanced Signal Processor audio card is a real-time QSound process. The main advantage of a real-time process is that it allows interactive control of the sound effects. Furthermore, we adopted a QSound algorithm that supports 33 QSound pan positions to create a 180-degree soundscape.

QSound is incorporated into the our Advanced Signal Processor audio card without any hardware addition or modification. We also provide a flexible upgrade path for our existing 16-bit audio card users. If you wish to upgrade your audio card with QSound, you can do so easily by purchasing our Advanced Signal Processor upgrade package.

Setting Up Your Speakers for QSound

To experience QSound, please ensure that your audio card software is properly set-up and functioning well.

To achieve optimum QSound imaging, you must take note of the following set-up instructions.

1. Place the speakers on the same plane. They must be placed at the same height and face you at the same angle (see Figure 3).

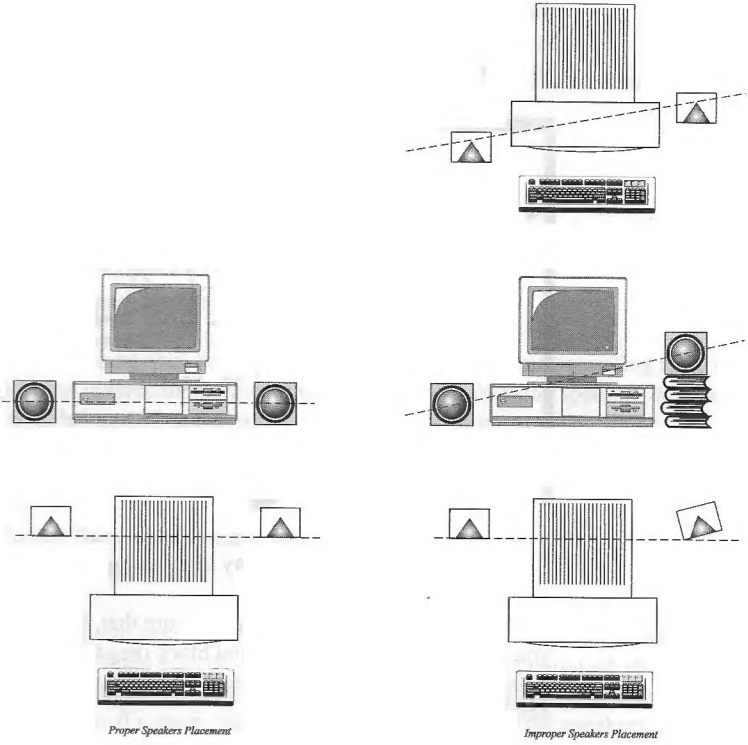

Figure 3: Speakers Placement

2. Make sure that the speaker geometry width or the speaker separation is between 16 inches (minimum) and 72 inches (maximum).

Note: When the speaker separation is 16 inches, the listener should be about 20 inches away from the speaker plane. The listener must also be at the center in between the two speakers. As the speaker separation increases, the listener's distance from the speaker plane should also be increased proportionally. You can run QSALIGN.EXE to locate the optimum distance (see next page).

3. If you prefer, you may angle the speakers slightly, but not more than 15 degrees from the speakers plane. If you are setting up your system in a small enclosed room, make sure that you place the speakers 3 feet away from side walls (see Figure 4).

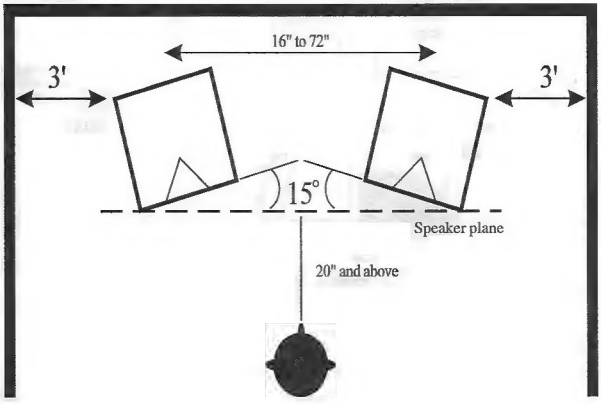

Figure 4: Speaker geometry in an enclosed room

4. If you are using a hi-fi system, make sure that, for both speakers, you connect the red (positive) and black (negative) speaker wires to the respective positive and negative connectors of your amplifier.

5. If the speakers have separate volume control, set the left and right speakers volume level as equally as possible. If your system has a single balance control, set it to the center or balanced position.

6. QSound listening is best done with speakers facing walls that are non-reflective surfaces (or as non-reflective as practical).

7. Adjust the speaker volume to a reasonable level.

Note: If the volume is too high or loud, the reflected signal may neutralize the QSound effect.

Using QSALIGN

To help you align your speakers correctly, you can run QSALIGN.EXE.

To run the alignment program

1. Change to \QSOUND.
2. Type QSALIGN and press <Enter>.

This program pans a sound source at the extreme left and the extreme right.

To listen to the left playback

1. Press the left-arrow key.

To listen to right playback

1. Press the right-arrow key.

After pressing each key, you should hear the sound source coming from a position outside the range of the two speakers. With the speakers between 16 inches and 72 inches apart, you can continue to press the left or right arrow key, and adjust your distance from the speaker plane to find a *sweet spot* to achieve an optimum QSound image.

To quit from the alignment program

1. Press <Esc>.

Note: If you have set up QSound properly but are not able to produce QSound effects, your speakers may be receiving out-of-phase signals. Try again with another pair of speakers. If you are using a hi-fi system, make sure you have connected the speakers correctly (see step 4 on page 4).

Experiencing QSound

You can experience QSound in both the DOS and Windows environments.

DOS environment

In the DOS environment, we have provided an auto running demo - QSDEMO.EXE.

To run the demo program

1. Change to \QSOUND.
2. Type QSDEMO and press <Enter>.

The demo program will first introduce QSound and then display a background picture of a desert. Next, you will see an object appear randomly at different positions on the screen. As the object appears at each position, you will hear the sound coming from that position. Notice also that some of the sounds seem to emanate from outside the speakers' range.

When the sound source is at the extreme left and extreme right position, you will not see the object on your screen.

To end the demo

1. Press <Esc>.

Windows environment

In the Windows environment, we have provided a QSound Control window which allows you to use and experiment with the QSound effect.

To activate the QSound Control window

1. Double click the QSound icon  in the audio's card group window.
   The QSound Control window similar to figure 5 appears.

By factory default, the QSound effect is on (enabled) as indicated by a **x** in the QSound On check box.

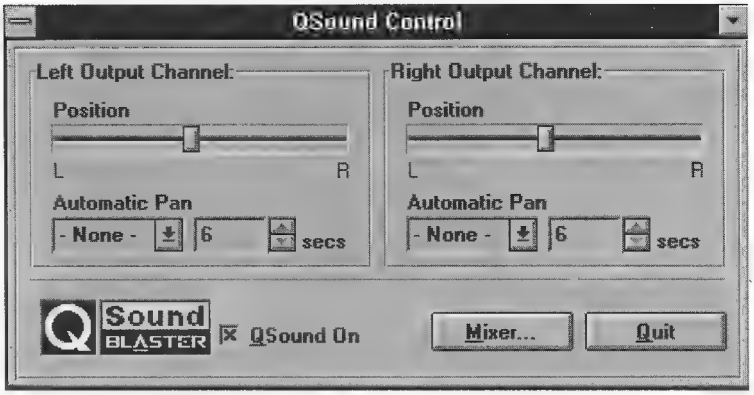

Figure 5: QSound Control Window

To disable QSound

1. Click on the Qsound On check box.

The **x** will disappear indicating that QSound is off or disabled.

Once you have enabled the QSound effect and set the desired panning parameters, all sounds that you play back under Windows will have the QSound effect.

The QSound Control window is divided into two main sections:

1. **Left Output Channel** - control for setting QSound parameters for the left output channel of your sound card (left speaker).
2. **Right Output Channel** - control for setting QSound parameters for the right output channel of your sound card (right speaker).

Note: For mono sound sources, use the Left Output Channel only.

For both channels (speakers), you can manually set the position of the sound source by dragging the respective **Position slider** to the desired position. You can also use the **Automatic Pan** drop-down list box to set the QSound panning effect.

To use the Position Slider (for both the Left and Right Output Channels)

1. Click on the respective Automatic Pan drop-down list box.
   The drop-down list box similar to Figure 6 appears.

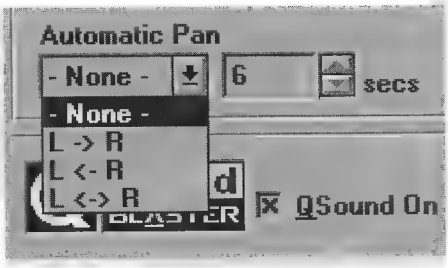

Figure 6: Automatic Drop-Down List Box

To use this option, you must first switch off the Automatic Pan option. To do so,

2. Click None.

To set the panning position

3. Drag the position slider to the desired position (see Figure 5.)

To use Automatic Pan

1. Click on the Automatic Pan drop-down list box.

To pan from Left to Right

2. Click L -> R.

For the affected channel, any sound that you play back will be panned starting from the left side of the sound stage to the right.

To pan from Right to Left

3. Click L <- R.

For the affected channel, any sound that you play back will be panned starting from the right side of the sound stage to the left.

To sweep between Left and Right

4. Click L <-> R.

For the affected channel, any sound that you play back will be swept between the right and the left of the sound stage for the specified pan duration time.

To set the pan duration for both channels

1. Click the **secs** spin-button to increase or decrease the pan duration time.

For the respective channels, the automatic pan duration is the time taken for the sound to move from one end to the other. If the time set for the automatic pan is less than the playback time of the sound source, the sound source will be at the final position of the automatic pan for the remaining time.

To control the volume, gain, and tone of various audio sources

1. Click the Mixer button to start your audio card's mixer application.

For more information on using the Mixer, please refer to the Creative Mixer chapter in your *User's Guide*.

To close the QSound Control window

1. Click the Quit button.

The QSound Control window has a set of factory default settings when you first activate it. All subsequent changes to the QSound Control window will be saved as the new default upon your exiting the QSound Control window.

Experiencing QSound in Mosaic

Our latest version of Mosaic has been modified to support QSound. As you move a tile to the left or right, the sound source will be coming from the extreme left or extreme right respectively. For more information on using Mosaic, please refer to your *User's Guide*.

Observing Some Tips When Using QSound

Our QSound implementation supports PCM wave playback of 8k, 11k, 22k and 44.1 kHz only.

Please take note that a normal stereo file having similar signals at the left and right channels, fully panned left or right, will not produce good QSound effects.

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Printed In Singapore

KKP WK 14/94 0421740017-1